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A NEW RACE OF *PARNASSIUS SMINTHEUS* FROM THE OLYMPIC MOUNTAINS OF WASHINGTON (LEPIDOPTERA, RHOPALOCERA)

BY W. N. BURDICK.

Los Angeles, California

In 1936 the author collected a large number of *Parnassius smintheus* at an elevation of about 7,000 feet on the bleak ridges of the Olympic Mountains in the state of Washington. These insects are so different in appearance from other *P. smintheus* that a racial name seems appropriate. Apparently this new race is restricted in range to the higher altitudes of the Olympic group of mountains, which are confined to the Olympic Peninsula, a very rugged and primitive wilderness. The distinctive qualities of this insect are constant, aside from the usual individual variation present in any similar race. I venture to describe it herewith, suggesting that it become known as

Parnassius smintheus olympianna race nov.

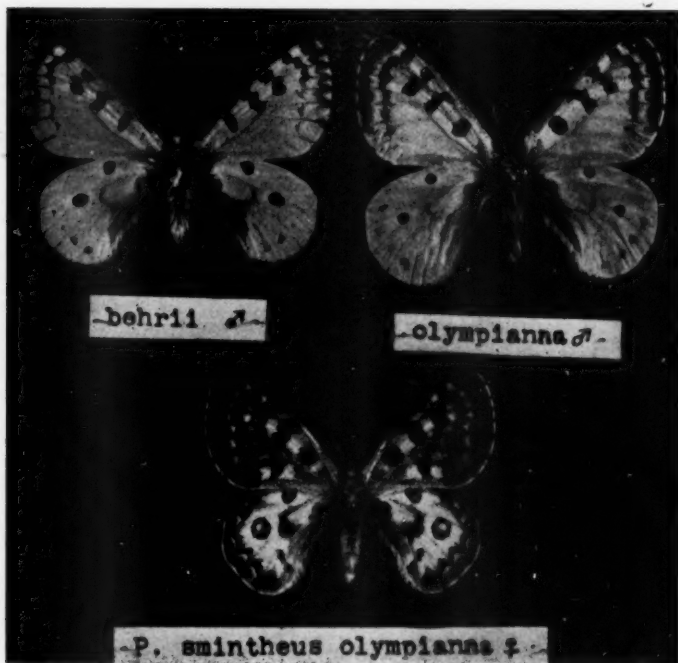
Male. Expanse 1.75–2.00 inches. Compared with a substantial series of topotypical *P. smintheus behrii* Edw., it exhibits much similarity in pattern and size. It differs in that the transparent margin of the primaries is broader than in *behrii*, also the postcellular spots and the ocelli of the secondaries are pupiled with a brilliant red instead of the ochraceous color of *behrii*. In *olympianna* the ocelli are more narrowly ringed with black, and the four spots across the basal area on the under side of the secondaries are red instead of black as in *behrii*. In both races the black spot near the centre of the inner margin of the primaries just above the submedian vein and the submarginal row of black spots in the interspaces of the secondaries are often present and as frequently entirely wanting.

Female. Expanse 1.75–2.00 inches. Upper side of primaries diaphanous. Some thin white scaling sprinkled with black in the discal area immediately below the cell, also along the costal margin and along the inner margin below the submedian vein. A transverse row of eight white lunular spots paralleling the outer margin, the eighth at the inner angle, often obsolescent; internal to this another, extradiscal, row of seven white spots irregular in shape, the fifth and often the sixth from the costa usually weak and frequently almost obsolete, the seventh large and subquadrate, twice as long as wide and bisected by a black patch often pupiled with red, about the centre of the inner margin just above the submedian vein. The cell white with a dark triangular spot toward the base, a large rounded black spot in the centre, and a broad tortuous bar on the arc. Two postcellular red spots margined with black extending from the costa, one below the other; a white spot on the costa internal to the first postcellular red spot. The base thinly veiled with black scales.

Secondaries: Upper side semiopaque white. A broad transparent margin, posteriorly serrate, enclosing a row of white lunules. Base and abdominal margin, as far as the end of the body, broadly black, projecting a hook-like maculation extending around the extremity of the cell, often almost encircling it. A bright red ocellus on the costa; a larger one on the disc, the latter usually pupiled with white as is occasionally the former, both margined with black. On the abdominal margin below the black area are two adjoining black spots often pupiled with red and separated by the internal vein.

The undersides of both wings marked as above except for four red spots shadowed with a few black scales across the basal area of the secondaries; the two anal black spots below the hook always reproduced with red centres usually pupiled with white. The pouch of the bred female is typical of *smintheus*, inconspicuous, brown and husk-like.

The fringes of both sexes narrow, white, and punctuated with small black points at the tips of the nervules. The entire body of the female, as well as



that of the male, black and amply clothed with grayish-yellow hairs becoming more produced and more distinctly yellow at the extremity of the abdomen and on the under side of it. Palpi small, yellowish. Antennae annulate, black and pale yellow, club black. Legs ringed, like the antennae, on the tarsi, brownish above.

Holotype—♂, Hurricane Ridge, Olympic Range, Clallam Co., Washington, July 29, 1936; No. 5191 in the Canadian National Collection, Ottawa.

Allotype—♀, same locality, August 1, 1936, in the Canadian National Collection.

Paratypes—2 ♂, 2 ♀, same locality, July 29, 1936; 1 ♀ Gray Wolf Range, Olympic, Mts. Clallam Co., Washington, August 2, 1936; all in the Canadian National Collection. 1 ♂, 1 ♀, Hurricane Ridge, Clallam Co., Washington, July 29, 1936, in the U. S. National Museum; 60 paratypes in the collection of the author from which specimens will be distributed to other prominent museums.

A PARTITION OF OUR *CRYPTOCHILUS*, WITH SOME NEW PSAMMOCHARIDAE (HYMENOPTERA)

BY NATHAN BANKS,

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The genus *Cryptochilus* is based on *C. annulatus* Fabr., a Mediterranean species; the pleura has numerous sharp carinae, the propodeum is striate, the antennae are fairly slender, the clypeus rather broadly concave below, the first recurrent vein ends near the tip of the second submarginal cell, the pronotum, seen from side, shows an even curve from behind down to the collar. Some other European species have the pleura less strongly striated. Several of our species agree fairly well in these characters; however there are others that show various differences.

In 1888 Radoszkowski made a new genus, *Priocnemioides*, to include three species, two from the United States and one said to be from Spain but really from South America. He separated the genus from *Priocnemis*, but did not distinguish it from *Cryptochilus* or *Salix*.

In 1900 Ashmead made the genus *Calopompilus* for *C. maculipennis*; in 1933 I made *Onochares* for *O. brazoria*. Lately Haupt has made two new genera for Australian forms. I have therefore divided our species, hitherto grouped under *Cryptochilus*, into six genera, three of them new.

As to *Priocnemioides*, I have noted already that it was distinguished from *Priocnemis* by characters that do not separate it from *Cryptochilus*. Haupt in 1927 called attention to the fact that the second ventral segment has a distinct hump each side. But the size of these humps vary in species; most of our species do not show them or only in a very faint degree. Most of the South American *Cryptochilus* (but not all) have these humps, but in these species the pronotum is not of the same shape in all. Therefore I cannot, without the discovery of other characters, consider *Priocnemioides* as more than a subgenus, based only on a variable character, often confined to the females.

SYNOPSIS OF GENERA

1. The marginal cell broadly rounded at tip, blunt; clypeus broadly concave below; the pronotum (seen from side) mostly flat, not greatly produced below on each side; antennae slender; propodeum rarely striate *Chilochares*
The marginal cell plainly somewhat acute at tip 2
2. Clypeus broadly concave below 3
Clypeus biconcave below, antennae slender *Cressochilus*
Clypeus plainly truncate, not at all concave below; pronotum (from side) somewhat flattened above 4
3. Abdomen (as rest of body) strongly hairy above, also on legs; antennae rather short and heavy *Onochares*
Abdomen not hairy above except at base and tip; antennae very slender; pronotum (from side) curving down from back to front, not at all flat; sides much produced below; propodeum usually ridged or striate transversely *Cryptochilus*
4. Joints of flagellum not twice as long as broad; propodeum not striate *Derochilus*
Joints of flagellum mostly more than twice as long as broad; abdomen short-haired above *Calopompilus*

The various species included in *Cryptochilus* are now allocated to the following genera.

Cryptochilus includes *cressoni*, *texasus*, *heiligbrodti*, *austrinus*, all with yellow wings, and the following with black wings: *flavicornis*, *magnus*, and *unifasciatus*.

Chilochaeres new genus, *birkmanni* (genotype), *severini*, *carinatus*, *terminatus*, *arizonicus attenuatus*, *pallidipennis*, with yellow wings, and *subopacus*, *atratus*, and *idonues* with black wings.

Calopompilus, *maculipennis* (genotype) and *rugosus*.

Onochaeres, *brazoria* (genotype).

Derochilus new genus, *validus* (genotype).

Cressochilus new genus, *nuperus* (genotype).

Within *Cryptochilus* two species, *cressoni* and *flavicornis*, can be placed in the subgenus *Priocnemioides*.

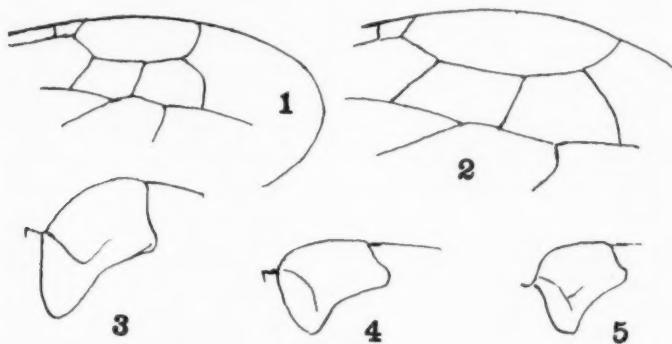


Fig. 1. *Chilochaeres birkmanni*, part of fore wing. 2. *Cryptochilus cressoni*, part of fore wing. 3. *Cryptochilus cressoni*, pronotum from side. 4. *Chilochaeres birkmanni*, pronotum from side. 5. *Derochilus validus*, pronotum from side.

Lophopompilus fraternus n. sp.

Similar in general structure and color to *L. carolina*, and of same size. Besides the yellow on the second segment, the first has the apical part also yellow, and the yellow is not divided. *Carolina* from three different states has the first segment wholly black. The most noticeable difference in structure is in the pronotum, in *carolina* short and sloping down in an even curve from the hind border; in *fraternus* longer, the part just in front of hind border nearly flat, then rather suddenly sloping forward. There is more and longer hair on the pronotum. The ocelli are in a slightly broader triangle than in *carolina*; the inner spur of hind tibia is fully two-thirds of basitarsus, a little longer than in *carolina*. In the fore wing the third submarginal cell is triangular or almost petiolate. Otherwise it is about the same as *carolina*.

Length fore wings 10.5 mm.

Two females from Salt Plains, Cherokee, Okla., 14 June (Brues). Type M. C. Z. no. 25264.

It is strange that its close relative *carolina* has such a different habitat; the type is from Blowing Rock, N. Car.; others are from Alpine, N. J., and Colebrook, Conn.

Anoplius papago n. sp.

Male. Body, legs, and antennae black, abdomen and some other parts with a purplish hue; lower face with silvery pubescence; wings a uniform black, hind wings not quite so dark. Head, pronotum, and propodeum with fine,

scattered, rather short hairs. Face but little narrowed below; vertex scarcely convex; ocelli in a nearly equilateral triangle, the anterior ocellus larger than the others, the laterals much nearer to each other than to eyes; a median line to antennae, latter short; pronotum angulate behind; propodeum without median groove; base of abdomen rather broad, last three ventral segments with rather long dense, erect hair, the area on the first of the three about as broad as the others. Legs slender; the spines very short, those on hind tibia not one-half the width of the joint, inner spur fully three-fourths of the basitarsus.

In fore wings the marginal cell is subtriangular, about one and one-fourth its length before wing-tip; the second submarginal nearly square, receiving the first recurrent near tip, the third submarginal much narrowed above, receiving the slightly curved second recurrent a little beyond middle; the nervellus is a little beyond end of the basal vein; in hind wings the anal ends at the fork.

Length of fore wing 7 mm.

One male from Tucson, Arizona (Snow). Type M. C. Z. no. 25263.

Anoplius comanche n. sp.

Male. Body, antennae, and legs deep black; lower face with silvery pubescence each side; apical segment brown or silvery according to light; lower apical corners of propodeum silvery; the outer side of mid coxae show a very distinct rufous tinge in certain lights; front coxae with whitish reflections toward base; abdomen rather dull black; last three ventral segments with brushes of low (but dense) hair on the anterior part of the segment, so, seen from side, three well separated brushes; wings nearly evenly fumose, only a little paler toward tip.

Face somewhat narrowed below; antennal pits deeper than usual; vertex scarcely convex across; ocelli in a moderately low triangle, the laterals much nearer to each other than to eyes; no median line to antennae; second plus third and fourth antennal joints not equal to vertex width; hind margin of pronotum almost angularly arcuate; propodeum with an apparently broad and shallow median depression, no line; abdomen elongate, basal segment not very broad; legs moderately slender, spines on hind tibia not nearly as long as width of joint; inner spur four-fifths of basitarsus. Hair on head very short and sparse, propodeum scarcely at all hairy.

Wings rather slender; marginal cell about one and one-third its length from wing-tip; second submarginal much narrowed above, receiving the first recurrent a little before tip; third submarginal cell triangular, receiving the second recurrent a little beyond middle; nervellus interstitial with basal vein; in hind wings the anal ends at the fork.

Length of fore wings 7 mm.

One from the Nueces River, Uvalde Co., Texas, 2 July (Bequaert). Type, M.C.Z. no. 25262.

Anoplius puella n. sp.

Male. Black; lower face with silvery pubescence; from above there is white hair on the front edge of the pronotum; posterior margin of pronotum narrowly pale; thorax and basal abdominal segment with silvery reflection in certain lights; apical border of the first segment, entire second segment above and the basal part below yellowish; last segment above with silvery pubescence; wings faintly smoky, the apical part broadly brown. Face narrow below; vertex only slightly convex; the ocelli in a low triangle, laterals not quite as near eyes as to each other; no median line to antennae; latter short, the second plus third and fourth joints hardly equal to vertex width; short hairs above and below

antennae; pronotum almost angulate behind; propodeum without median line, hardly hairy above, but with fine hairs on sides; basal abdominal segment rather broad, second and third only a little broader; the last two ventral segments with brushes of black hairs, the hair longer near base than behind.

Legs slender, spines on hind tibia mostly not as long as width of joint; the inner spur equal to fully four-fifths of the basitarsus; front coxae with only two or three hairs near upper edge. Marginal cell subtriangular, fully one and one-half times its length from wing-tip; second submarginal a little longer than high, receiving the first recurrent near tip, third submarginal cell short-petiolate, receiving the second recurrent at about middle; nervellus interstitial with basal vein, in hind wing anal ends at the fork.

Length of fore wing 6.5 mm.

One from Galveston, Texas (Brues). Type, M.C.Z. no. 25261.

***Dipogon sayi* n. sp.**

Black, partly shining, mouth parts, legs, and clypeus brown to black; wings hyaline, bifasciate with black, tip faintly gray, sometimes extreme tip slightly brownish (white in *D. caliptera*). In the fore wings the marginal cell is subtriangular, the lower outer margin being nearly straight from the apex of the second submarginal cell (as is common in the genus); the first recurrent ends at or beyond middle of the second submarginal cell; the second recurrent vein, much curved, ends much before the middle of the third submarginal cell; in the hind wing the anal ends before the fork. The third submarginal cell is narrowed above, sometimes less than half, sometimes more than two-thirds. The basal half of abdomen above is polished, the apical third above and below is very hairy, mostly black, but some near tip of abdomen are rufous. The hair on propodeum is mostly white and each side behind quite thick. The lower part of face has short, appressed, white pubescence, the vertex has erect black hair. The lateral ocelli are a little nearer to each other than to the eyes.

Length of fore wing 5.5 mm.

Many specimens from Falls Church, Great Falls, and Chain Bridge, Va.; Black Mt., N. Car.; Port Jefferson, Ft. Montgomery, Grand Island, N. Y.; Conewago, Penna.; Colebrook, Conn.; Holliston, Cohasset, Stony Brook, Mass.; Ridgeway and Montreal, Canada. Type M.C.Z. no. 25259.

This species has been considered as the *caliptera* of Say; but Say's description calls for yellowish antennae, front legs, and mouth parts, which fits *D. pilosa*, so the latter name is a synonym of *D. caliptera*.

***Pseudagenia ariella* n. sp.**

In general much like the eastern *P. nanella*. Body metallic blue, abdomen usually darker, clothed with white hair on pronotum and propodeum, that on latter shorter than in *nanella*, long white hair under eyes; face with white pubescence near each eye; antennae and legs black; wings nearly hyaline, veins dark.

Lower border of clypeus evenly convex; ocelli in a nearly equilateral triangle (in *nanella* a little more narrow), the laterals, however, plainly nearer to each other than to eyes; fourth antennal joint only a little shorter than third.

Legs a little shorter than in *nanella*, most evident in the hind pair, long spur of hind tibia about one half of basitarsus (shorter in *nanella*). The wings are about the same, the third submarginal cell shorter; the basal vein is practically interstitial with the nervellus (in *nanella* plainly before).

Length of fore wing 5 mm.

Three from Tempe, Arizona, 31 July, 1 to 4 August (Bequaert). Type M.C.Z. no. 25260.

A male from Little Tesuque Canon, vicinity of Santa Fe, New Mexico, probably of this species, is marked like *nanella*, the sides of clypeus yellow and the yellow extending up along orbits as high as the antennae.

NEW SPECIES OF CANADIAN LEPIDOPTERA*

BY T. N. FREEMAN,
Ottawa, Ont.

ARCTHIDAE

From our insect faunal surveys of the maritime provinces of Canada, we have accumulated a long series of a species of *Eubaphe* which inhabits the cold sphagnum bogs, and being quite unlike any so far described, I propose for it the name:

Eubaphe lamae n. sp.

Male. Antennae black, light above. Palpi, head, thorax and fore wings dark brown with a slight orange tinge more noticeable along the costa; usually a well defined subcircular white spot just below the origin of Cu_2 ; an obscure black spot at the upper end of the cell, beyond which is a faintly orange area. Hind wing light orange with outer third black, the inner margin of the black area irregular, and continuing along the region of the anal veins to the base of the wing; black discal dot large, distinct. Fringe fuscous. Abdomen yellowish-orange, basal segment brown above; other segments each with a black dorsal band (sometimes reduced to appear as a broken, black line). Underside: Fore wing uniformly salmon pink. Hind wing orange-yellow with black scaling in the anal region. Expanse, 22 mm.

Female. Fore wing concolorous with that of the male (or lighter with an orange tinge); white spot below Cu_1 usually larger than that of the male and often with a similarly colored smaller spot just beyond; dark submarginal band present, often obscure. Hind wing light orange; black band as in male (frequently broken into two blotches), the anal portion large, irregular, extending almost to the outer margin and continuing as a streak in the anal region to the base of the wing; the upper portion of the black area more remote from the outer margin; black discal spot large and distinct. Fringe yellowish-orange. Abdomen as in male, with the dorsal black bands larger. Underside as in male except with large black discal spot on each wing, and with the black band of the upperside of the secondaries repeated below. Expanse, 24 mm.

Holotype—♂, Baddeck, N. S., July 10th, 1936 (J. McDunnough); No. 5164 in the Canadian National Collection, Ottawa, Ont.

Allotype—♀, same data, July 17th, 1936.

Paratypes—32 ♂♂, 4 ♀♀, Baddeck, N. S., July 2 to 21, 1936, (J. McDunnough and T. N. Freeman); 6 ♂♂, Waweig, N. B., June 28 to July 5, 1938, (T. N. Freeman); 11 ♂♂, 7 ♀♀, Tracadie, N. B., July 22, 1939, (J. McDunnough and W. J. Brown); 2 ♂♂, 3 ♀♀, Tabusintac, N. B., July 20 to 26, 1939, (J. McDunnough and W. J. Brown).

This species resembles *aurantiaca* Hbn. more closely than any other from which it can be easily separated by the darker ground color of the fore wings with their characteristic white spot in both sexes; by the orange-yellow color of the basal two-thirds of the secondaries instead of rosy-salmon as in *aurantiaca*; by the much broader apical black banding of the secondaries, with the black continuing, in the region of the anal veins, to the base of the wing; and by the lighter color of the undersurface, especially that of the secondaries.

I am unable to see any structural difference in the male genitalia of *lamae* and *aurantiaca*, but because of the unique maculation and sphagnum bog habitat of *lamae*, it is probably specifically distinct. In Manitoba, as represented by a few specimens before me from Berens River, Norway House, Husavick and Bird's Hill, the ground color of the primaries of *lamae* is much darker, but until more material can be studied, it is difficult to ascertain if these specimens are worthy of racial distinction.

*Contribution No. 2082, Division of Entomology, Science Service, Department of Agriculture, Ottawa.

OLETHREUTIDAE

I wish to acknowledge, with appreciation, the assistance given by Mr. Carl Heinrich of the Bureau of Entomology and Plant Quarantine, Washington, D. C., for his examination of the species of Olethreutidae described below.

***Polychrosis piceana* n. sp.**

Palpi white inwardly, ochreous outwardly. Front white, overhung with light tawny scales. Antennae ochreous, the apical portion of each segment banded above with black. Vertex and thorax light tawny, the latter mixed with black posteriorly. Ground color of the fore wing dark brown; basal fourth dark brown, the central portion of which reflects metallic in oblique light, and its outer margin slightly angled outward near the middle; outer three-quarters of costa with five white geminations, each pair of spots being separated by a fine streak of the ground color; extending from the first gemination to the posterior margin is an antemedial leaden streak, slightly narrower at the middle and interspersed and margined with tawny scales; similarly colored streaks extend posteriorly from the next two geminations, unite into one about midway across, and continue to the hind margin; a similar streak extends from the fourth gemination obliquely outward to the middle of the outer margin; a similar short narrow streak connects the fifth costal gemination with the streak below the fourth; a similar streak occurs near the outer margin just below the tornus; apex with a few tawny scales; fringe shining fuscous with black basal line. Hind wing fuscous; fringe grey with dark basal line. Expanse, 10 mm.

Male genitalia of holotype (fig. 1). Clasper with long tuft from base of sacculus; both spine clusters well developed; aedeagus with two short teeth near the middle of the right side.

Holotype—♂, Senneterre, Que. Emerged in incubator, Mar. 2, 1940; reared from black spruce by the Forest Insect Unit; No. 5165 in the Canadian National Collection, Ottawa, Ont.

Paratype—1 ♂, Pensive Depot, Lake Baskatong, Que.; Mar. 2, 1940. Similarly reared.

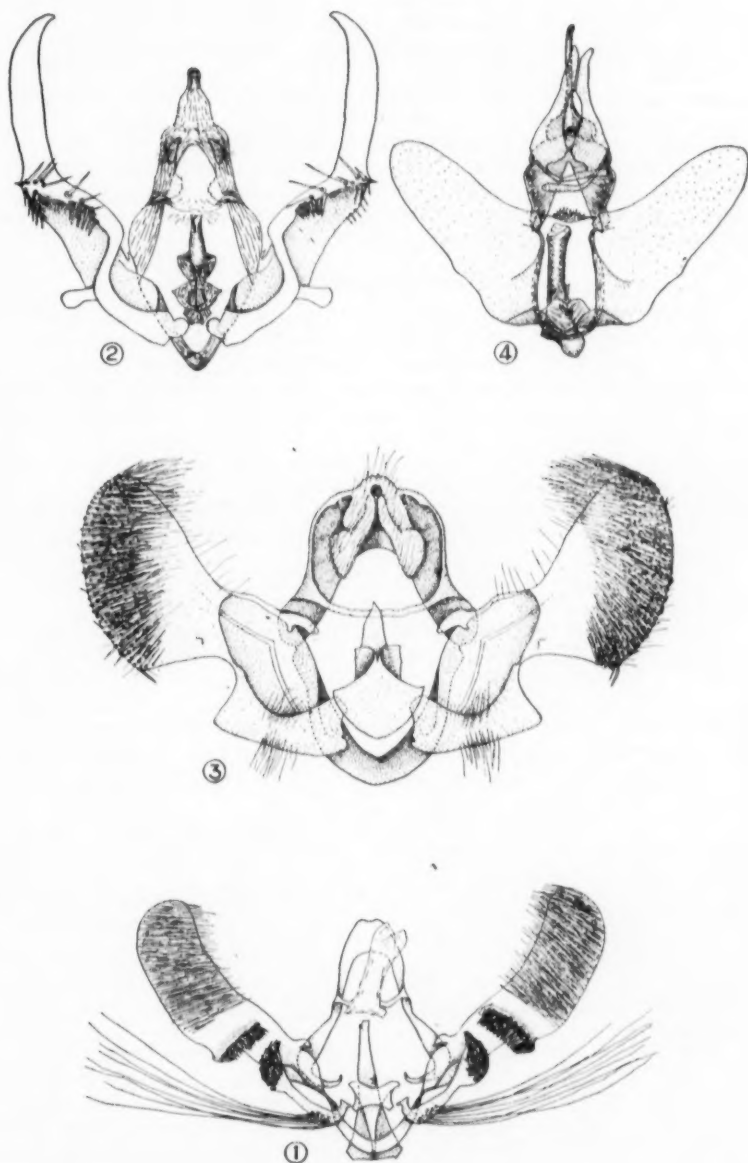
This species shows affinities with *palliolana* McD., from which it is easily differentiated by the presence of the short teeth on the aedeagus.

***Exartema lacunatum* n. sp.**

Palpi whitish ochreous; second joint with two small, black scale patches on the outer side; third joint black, whitish ochreous at base. Front white. Vertex light ochreous with an admixture of black. Thorax fuscous, intermingled with rust-colored scales. Abdomen steel-grey above, lighter beneath. Ground color of primaries light ochreous, finely reticulate with brown (under magnification appearing as whitish and ferruginous scales streaked with black and leaden ones); the usual maculation distinct; basal patch dark brown; dorsal portion of median band ferruginous, narrowly separated from costal portion by the ground color; costal portion of median band dark brown with ferruginous scaling at its middle, both teeth longer and more acute than those of *permundatum* Clem.; tornal patch dark brown, large and subtriangular; subapical bar broad, dark brown mixed with ferruginous, and separated from the costal margin by a fine area of the ground color; the four geminate oblique streaks on the outer half of the costa, separated by small, very dark brown patches. Fringe pale with black basal line and with dark areas at the apex and at the middle of the outer margin. Secondaries smoky, becoming paler basally in both sexes. Fringe pale with dark basal line. Expanse, 19 mm.

Male genitalia of paratype (fig. 2) similar to those of *exacresimum* Heinr., but the flat, spatulate, hairy projection from the neck of the clasper, near the

PLATE VIII.



1. Male genitalia of holotype of *Polychrosis piccana* n. sp.
2. Male genitalia of paratype of *Exartema lacunatum* n. sp.
3. Male genitalia of holotype of *Barbara mappana* n. sp.
4. Male genitalia of paratype of *Sparganothis solidana* n. sp.

sacculus and replacing the usual spined digitus, is longer and narrow in *lacunatum*.

Holotype—♂, Grand Bend, Ont., July 11, 1934, (T. N. Freeman); No. 5166 in the Canadian National Collection, Ottawa, Ont.

Allotype—♀, same data as holotype, July 11, 1934.

Paratypes—32 ♂♂, 16 ♀♀, same locality, July 10 to 15, 1934, (T. N. Freeman); two males and one female deposited in the United States National Museum, Washington, D. C.

Certain specimens show a tendency toward melanism in which case the ferruginous scaling is replaced with dark brown. The extreme melanic form has the usual maculation totally obliterated. Superficially this species somewhat resembles *permundatum* Clem., but characters in the male genitalia would place it near *exaeresimum* Heinr.

Barbara mappana n. sp.

Male. Palpi, head, and thorax hoary-grey; thoracic tuft light brown. Fore wing above grey, reticulated with numerous black, wavy lines, often narrowly bordered with light brown. These lines situated as follows: A wavy basal line from the anal angle almost to the costa; beyond this at about the basal quarter is a line extending from the costa to the posterior margin, widening near its middle to include an irregular patch of the ground color; beyond this, at the middle, an irregular line extends completely across and is wider at the costal and posterior margins; beyond this, before the apex are three lines extending backward from the costa where they ramify with one another to enclose several irregularly shaped patches of the ground; a semicircular line starts at the apex, curves along the costa for a short distance, and continues backward to the outer margin near the apex, almost enclosing a circular area of the ground color. Hind wing fuscous; fringe light grey with a dark basal line. Expanse, 15 mm.

In the female, the black ramifying lines are more strongly bordered with light brown, causing the wing to appear browner than that of the male. The basal half of the forewing contains three irregular lines extending from the costa to the posterior margins; beyond these are five lines along the costa which ramify with one another below to enclose numerous patches of the grey-colored ground. Hind wing fuscous; fringe whitish with a dark basal line. Expanse, 16 mm.

Male genitalia of holotype (fig. 3). Cucullus of clasper much less pointed than in any other species of *Barbara*.

Holotype—♂, Trinity Valley, B. C. Emerged in incubator, Mar. 9, 1940. Reared from cones of *Picea engelmanni* (Forest Insect Unit); No. 5167 in the Canadian National Collection, Ottawa, Ont.

Allotype—♀, Sand Lake, Ont. (Sault Ste. Marie region). Emerged in incubator, Mar. 2, 1940. Reared from Balsam cones (Forest Insect Unit).

TORTRICIDAE

Sparganothis solidana n. sp.

Palpi light ochreous with violaceous luster; front with appressed white scales, overhung roof-like with long, dark ochreous scales with violaceous reflection; fore and mid legs dark purplish-ochreous outwardly, cream-colored inwardly; hind legs light; thorax and fore wings uniformly shining ochreous, the wings finely reticulate with darker raised scales, more numerous along the costal, outer, and hind margins and reflecting greenish in oblique lighting; (in some specimens the reticulations are absent or nearly so); costal margin cupreous; discal dot at end of cell elongate, composed of raised scales and appearing as a dark or smoky dash. Hind wings shining smoky (rarely faintly so). Fringes shining, ashy white with dark sub-basal line separated from the edge of the wing

by a narrow light border. Underside of all wings uniformly shining smoky, with ochreous costal regions and shining ashen white fringes. Expanse, ♂ 22 mm., ♀ 23 mm.

Male genitalia of paratype (fig. 4). Uncus long, slender, curved; gnathos with long hairy, parallel, finger-like apices; arms of gnathos clavate, their apices barbed with short hairs; transtilla arcuate, slightly emarginate at middle, with numerous short thick spines; clasper broad, flat, membranous, broadly, but shortly lobed inwardly; aedocagus pistol shaped.

Holotype—♂, Brackley Beach, Prince Edward Island, Aug. 7, 1940. (J. McDunnough); No. 5190 in the Canadian National Collection, Ottawa, Ont.

Allotype—♀, same data as holotype, Aug. 6, 1940.

Paratypes—9 ♂♂, 14 ♀♀, same data, Aug. 2 to 9, 1940.

Superficially this species would appear to resemble *demissana* Wlshm., judging solely from his description and figure (Lep. Het. IV, 19, Pl. LXIV, fig. 9, 1879), but it can easily be separated by the smoky, instead of pale, straw-colored hind wings.

Dr. J. McDunnough reared this species from pupae found at Brackley Beach, P. E. I., in the tied-up terminal leaves of *Solidago sempervirens*. Although only pupae were found, it was evident that the larvae fed and pupated in this position on the plant.

NEW SPECIES OF *HERCOSTOMUS* FROM WESTERN NORTH AMERICA (DIPTERA, DOLICHOPODIDAE)*

BY F. C. HARMSTON AND G. F. KNOWLTON †.

Logan, Utah

The following paper deals with six apparently undescribed species of *Hercostomus* collected from localities in the western United States and Canada.

Hercostomus chaetiflamellus n. sp.

Male. Length, 4 mm.; of wing, 3.8 mm. Face wide, silvery white. Front silvery white, concolorous with face. Antennae black, the third joint about as long as broad, evenly rounded below. Orbital cilia white, the uppermost bristle black. Palpi and proboscis yellow.

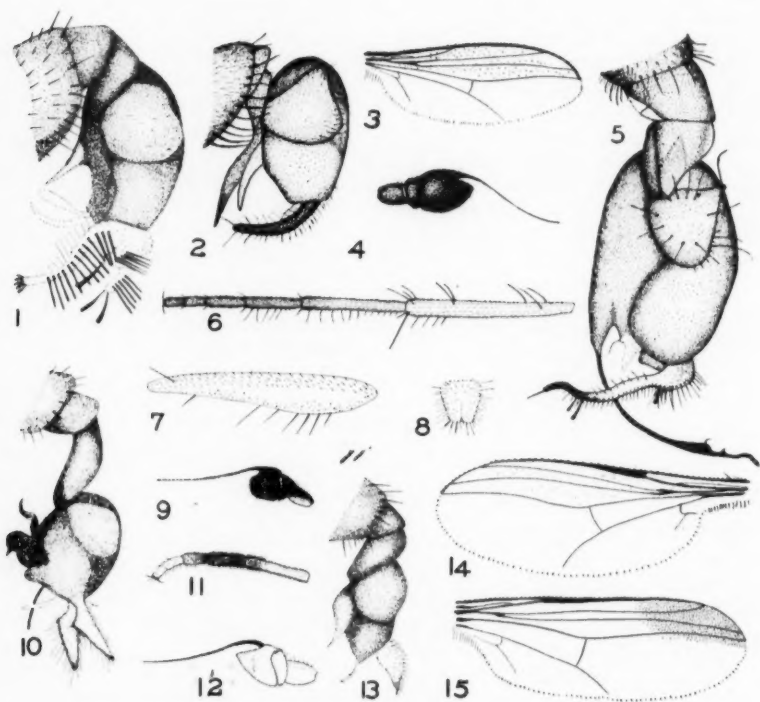
Dorsum of thorax green with bronze reflections along the lateral margins, yet so thickly dusted with white pollen as to appear silvery when viewed obliquely; pleurae and lateral margins of abdomen dull green with silvery white pollen; dorsum of abdomen metallic green with bronze reflections. Hypopygium (fig. 1) black, dusted lightly with white pollen, the rounded side piece near base with pronounced greenish reflections; lamellae long, slender, yellow, with two short projections near the base, these and the longer, main branch thickly fringed with strong, black, somewhat flattened bristles, at the extreme tip with a fringe of short, black, scale-like bristles; inner appendages yellow.

Fore coxae yellow, the anterior surface with minute pale hairs (easily overlooked) and approximately four black bristles at the tip; middle and hind coxae concolorous with pleurae, their tips narrowly yellowish. Femora and tibiae yellow; middle and hind femora each with a single preapical bristle, their lower surfaces nearly glabrous; fore tibiae with a slender, yellow bristle at

*Contribution from the Department of Entomology, Utah Agricultural Experiment Station. Report on project 51-A.

†Graduate assistant and research associate professor, respectively.

extreme tip, extending parallel with the basitarsi and reaching nearly to its middle; posterior tibiae narrowly but sharply blackened at tips, with the apical third, on inner surface densely covered with short, blackish hairs; posterior surfaces of middle and hind tibiae densely pollinose, appearing silvery. Fore tarsi wholly yellowish; middle tarsi yellowish, yet the tips of the first three joints and the whole of the fourth and fifth joints brownish; posterior tarsi black. Joints of fore tarsi as 15-9-6-4-3; of middle tarsi as 13-5-4-3-4; of posterior tarsi as 12-15-10-6-5. Calypters and halteres pale yellow, the former with black cilia.



Hercostomus chaetilamellus n. sp. Male, 1. *H. torridus* n. sp. Male, 2, 7, 12. *H. cryptus* n. sp. Male, 4-6, 14. *H. neocryptus* n. sp. Male, 15. *H. albipodus* n. sp. Male, 8-9, 11, 13. *H. cachiae* n. sp. Male, 3, 10.

Wings grayish hyaline; veins brown, yellowish toward base; costa very slightly thickened at tip of first vein, from which point it tapers gradually; fourth vein with a broad bend near the middle of last portion, from which point it is nearly parallel with the third vein; anal angle prominent, evenly rounded.

Described from two males, both taken in Orange County, California. July 14, 1929, by P. W. Oman. Holotype male returned to the University of Kansas; paratype male in insect collection of Utah Agricultural Experiment Station.

Taxonomy. *Hercostomus chaetilamellus* n. sp. may be distinguished from other North American species of the genus by the peculiar structure and chaetotaxy of the hypopygial lamellae. It is distinguished from *H. impudicus* Wheeler, which it resembles in general appearance, by having wholly pale posterior

femora, the hind femora in *impudicus* being blackened at tip on the upper edge; in *impudicus* the third antennal joint is nearly two times as long as broad, while in *chaetilamellus* the third antennal joint is scarcely longer than broad. The lamellae in *impudicus* are fringed with sharp bristles and the extreme tip is broadened; the lamellae in *chaetilamellus* are fringed with long, flattened bristles, and the tip is scarcely wider than the portion which precedes it.

***Hereostomus torridus* n. sp.**

Male. Length, 3.5 mm.; of wing, 3.2 mm. Face narrow, silvery white. Front greenish, its surface dulled with thick white pollen. Palpi and proboscis yellow. Antennae (fig. 12) yellow, the third joint brownish on apical half, slightly longer than broad, pointed at tip; arista black. Orbital cilia wholly white, except uppermost bristle has a brownish cast in certain lights.

Dorsum of thorax metallic green, yet so thickly dusted with white pollen as to appear silvery when viewed obliquely; pleurae greenish with thick white pollen, the posterior margin wholly yellow from above posterior coxae. Abdomen with first segment wholly yellow; second segment yellow except for narrow posterior margin; third segment yellow, greenish on anterior and posterior margins; other segments wholly greenish (except yellow venter of fourth segment), lightly dusted with whitish pollen; bristles on posterior margin of fifth segment long, conspicuous. Hypopygium (fig. 2) yellow, except for basal portion, its lamellae black, long, somewhat scimitar-shaped, with a slight angulation on upper edge, fringed on all edges with long yellowish cilia.

Coxae and all of legs wholly yellow. Hairs on anterior surface of fore coxae minute, white, the bristles at tips brownish. Middle and posterior coxae each with a prominent black bristle upon outer surface. Middle femora (fig. 7) with a single outer preapical bristle, and a longer inner preapical bristle, the latter situated lower and more basally than the outer bristle; near its middle on lower edge is a row of about six brownish, cilia-like hairs which are nearly as long as the width of femora. Posterior femora with a single preapical bristle. Fore tibiae with a row of short, sharp black bristles along inner anterior edge, as is characteristic of most species of the genus; middle tibiae without a bristle below; posterior tibiae slightly thickened toward the tip, with a short, black, flattened bristle (easily overlooked) on the inner edge, at the extreme tip. Tarsi of plain structure, the joints of fore pair as 10-5½-5-4-3; of middle tarsi as 15-9-7-5-4; of posterior tarsi as 9-14-7-5-3. Calypters and halteres yellow, the former with light cilia which appear brownish in certain lights.

Wings wholly grayish hyaline, the veins yellowish; third and fourth veins converging toward their tips yet nearly parallel near the wing tip; anal angle moderately prominent, evenly rounded.

Female. Like the male in general appearance, except that face is wider; the middle femora lack the row of bristles on lower edge near the middle; yellow of third and fourth segments of abdomen is more extensive than in male, the wings broader, the anal angle more prominent.

Described from 11 males and 6 females, all taken in Utah. The holotype male, allotype female, and two paratypes from Leeds, June 22, 1940; thirteen paratypes from Monticello, July 23, 1940, all taken by G. F. Knowlton and F. C. Harmston. Holotype and allotype in U. S. National Museum. Paratypes in the insect collections of the Utah Agricultural Experiment Station, California Academy of Sciences, Canadian National Museum, Ohio State University and University of Kansas.

Taxonomy. *Hereostomus torridus* n. sp. traces in the Curran key (American Mus. Novit. No. 682) to *H. ventralis* Loew. from which it is readily separated by the color of the orbital cilia, these being entirely black in *ventralis*. From

H. flavicornis (Van Duzee) (described as *Paraclius flavicornis* from Arizona) which it resembles in general external appearance, *torridus* is distinguished by having long, black hypopygial lamellae, whereas the lamellae of *flavicornis* are small, pale yellow.

***Hercostrabus cryptus* n. sp.**

Male. Length, 3.2 mm.; of wing, 2.5 mm. Face of moderate width, narrowed in the middle, silvery white. Front thickly dusted with white pollen which nearly conceals the greenish ground color. Antennae (fig. 4) black; third joint slightly longer than wide, evenly rounded below, pointed at tip; arista nearly basal. Orbital cilia white, about four of the upper cilia on each side black. Palpi and proboscis brown, their hairs black.

Thorax and abdomen metallic green; pleurae and lateral margins of abdomen with white pollen, giving their surfaces an almost silvery appearance when viewed obliquely. Hypopygium (fig. 5) black, dusted with white pollen; outer lamellae yellow with shining black tip, of slender structure, curved inwardly in a semicircle, the lower edge deeply jagged, fringed with strong black bristles; inner appendages yellowish.

Coxae and femora black; fore and middle coxae and all femora narrowly yellow at apices; middle and hind femora each with one preapical bristle. Trochanters yellow; tibiae yellow, the posterior pair black and slightly thickened on apical fourth; middle tibiae (fig. 6) without bristles below except for a series of 4 hair-like bristles near apical fifth and a single, long bristle at extreme tip. Fore and middle tarsi black from tip of first joint, the middle tarsi (fig. 6) fringed with long cilia-like hairs on lower side of first and second joints; these hairs appear as a continuation of the row which begins near the apex of the middle tibiae. Posterior tarsi wholly black. Joints of fore tarsi as 9-4-3-3-4; of middle tarsi as 15-8-5-4-4; of posterior tarsi as 10-13-8-5-5. Calypters and halteres yellow, the former with black cilia.

Wings (fig. 14) grayish, appearing smoky in front of 4th vein and along cross-vein; costa thickened at tip of first vein, from which it tapers rapidly toward the tip of fourth vein; anal angle not prominent, evenly rounded.

Female. Like male in all respects except the usual sexual characters; face wider; third antennal joint shorter and broader; middle tarsi lack the row of hairs on lower edge of first and second joints; wings are broader.

Described from 9 males and 7 females, all taken near Manila, Utah, along Sheep Creek, July 17, 1940, by the G. F. Knowlton and F. C. Harmston. Holotype and allotype deposited in the U. S. National Museum; paratypes in the Utah Agricultural Experiment Station, California Academy of Sciences and University of Kansas insect collections.

Taxonomy. *Hercostrabus cryptus* n. sp. traces to *H. ovaticornis* V. D. in the Curran key (Amer. Mus. Novit., No. 682, 1933) differing, however, in having white orbital cilia, while the cilia in *ovaticornis* are wholly black. *H. cryptus* n. sp. is much like *H. costalis* V. D., described from Ontario and Michigan, but differs in the structure of the middle tarsi which are of plain structure in *costalis* and the base of posterior femora are broadly yellow.

***Hercostrabus neocryptus* n. sp.**

Male. The male of *neocryptus* n. sp. is like the male of *cryptus* n. sp. in nearly all respects, including color of body and legs, the structure and chaetotaxy of the hypopygial lamellae and the middle tarsi. In the color of the wings the two species differ markedly. The wing of *cryptus* (fig. 14) is wholly grayish hyaline, without spots of any kind, while the wing of *neocryptus* (fig. 15) possesses a blackish area near the apical, front margin. There is absolutely no gradation in the color of wings in the long series of *cryptus* examined.

Female. Like the male in general appearance, differing, however, in having fore and middle femora brownish at base, the apical half yellowish; posterior femora yellow on basal half, the remainder black; wing as in male except the blackened area is larger, the anal angle more prominent.

Described from two males and one female. Holotype male taken at Lethbridge, Alberta, Canada, July 18, 1923, by H. E. Gray; allotype female taken at Edmonton, Alberta, Canada, August, 1927, by H. A. MacGregor; paratype male taken at Spokane, Wash., Sept. 7, 1940, by F. C. and V. H. Harmston. The two specimens from Canada were among material lent for study by Professor E. H. Strickland and have been deposited in the Canadian National Museum; paratype in the insect collection of the Utah Agricultural Experiment Station.

Taxonomy. The blackened apical area of the wing, together with the chaetotaxy of the middle tarsi, readily distinguish this from other North American species of *Hercoctomus*.

***Hercoctomus albipodus* n. sp.**

Male. Length, 3.5 mm.; of wing, 3.4 mm. Face wide, short, leaving the lower edges of eyes exposed, silvery white. Front densely pollinose, silvery white. Antennae (fig. 9) black, the first joint long and somewhat brownish on lower edge; third joint short, as broad as long, nearly truncate at tip. Palpi and proboscis yellow. Orbital cilia white, about four of the upper cilia on each side black.

Dorsum of thorax and abdomen metallic green; pleurae and abdominal venter silvery pollinose. Hypopygium (fig. 13) black, whitish pollinose, short and compact; outer lamellae yellow, leaf-like, yet truncate at tip when viewed from behind, appearing broadly joined together at bases (fig. 8), their surfaces and edges covered with yellowish hairs which are more brownish near base.

Coxae, femora and tibiae yellow; middle coxae darkened on outer surface. Middle and hind femora each with one preapical bristle. Middle tibiae without a bristle below except at extreme tip. Fore tarsi (fig. 11) with first joint yellow, darkened at apex; second and third joints black, slightly compressed laterally; fourth and fifth joints nearly white; posterior tarsi wholly black, except the extreme base of first joint which appears more brownish. Joints of fore tarsi as 12-6-5-5-4; of middle tarsi as 16-10-7-5-4; of posterior tarsi as 10-15-10-6-4. Calypters and halteres yellow, the former with black cilia.

Wings grayish, the veins yellowish.

Female. Like the male in most respects except for usual sexual differences; face wider than in male; third antennal joint shorter, its tip more pointed; last two joints of fore tarsi more brownish than in male.

Described from six males and one female, all taken in Kanosh Canyon, Utah, July 12, 1940, by G. F. Knowlton and F. C. Harmston. Holotype and allotype deposited in the U. S. National Museum; paratypes in the insect collection of the Utah Agricultural Experiment Station, the University of Kansas, the California Academy of Sciences, and Canadian National Museum.

Taxonomy. *Hercoctomus albipodus* n. sp. is readily distinguishable from other North American species in the fourth and fifth joints of fore tarsi being whitish, the second and third joints being perceptibly compressed laterally; the hypopygium is comparatively small for the genus.

***Hercoctomus caehene* n. sp.**

Male. Length, 2.6 mm.; of wing, 2.2 mm. Face wide for a male, silvery white. Front metallic green, its surface somewhat dulled with grayish pollen. Antennae black, third joint as broad as long, obtusely pointed at tip; arista nearly basal. Orbital cilia wholly black. Palpi and proboscis black.

Thorax and abdomen metallic green; pleurae and lower basal portions of abdomen dulled with white pollen. Hypopygium (fig. 10) black, with white pollen which gives it a dull appearance; pedicel long, slender; inner appendages of rather complicated structure, consisting of a pair of shining black, cork-screw-like structures, and a pair of jet black, blunt appendages bearing a short, thick, needle-like, backwardly-directed point near their apices; outer lamellae elongate-triangular, yellowish with margins infuscated, the surfaces and edges fringed with brownish-yellow cilia.

Coxae black, their hairs and bristles black. Femora yellow, the posterior pair black on apical half; middle and posterior femora each with a single pre-apical bristle. Fore and middle tibiae yellow; posterior tibiae wholly black. Tarsi of plain structure, the fore and middle pairs blackened from the tip of first joint; hind tarsi entirely black. Joints of fore tarsi as 7-4-3-2-2; of middle tarsi as 11-6-5-4-3, and of hind pair as 8-9-5-4-3. Calypters and halteres yellow, the former with black cilia.

Wings (fig. 3) grayish, appearing a little smoky in front of fourth vein; third and fourth veins converging near their tips; anal angle evenly rounded, quite prominent.

Described from one male taken approximately 5 miles south of Avon, Utah, on the Avon-Liberty road, at the extreme south end of Cache Valley, July 5, 1940, by G. F. Knowlton and F. C. Harmston. Holotype deposited in the U. S. National Museum.

Taxonomy. The wholly black posterior tibiae, together with the yellow fore and middle tibiae, and the peculiar structure of the inner appendages of the hypopygium readily distinguish this from all other North American species of *Hercostomus*. The hind femora, yellow on basal half and black on apical half offers another distinguishing character.

THE *PULVERULENTA* GROUP OF THE GENUS *PSEUDANARTA* GROTE (LEPIDOPTERA, PHALAENIDAE, CUCULLIINAE)

BY J. G. FRANCLEMONT,

Cornell University, Ithaca, New York

After Barnes and Benjamin transferred *pulverulenta* Smith to *Pseudanarta* Grote (Pan-Pacific Entomologist, III, 110-111, 1927), it was thought that the matter ended there, as the species had obviously been referred to the correct genus. However, in the course of working over the Cuculliinae, a number of slides of the genitalia of this "species" were made, and these exhibited constant differences, which made me believe that we were dealing with a group of species and not one.

During a visit to the United States National Museum, I discussed this matter with Mr. J. F. Gates Clarke, and he most generously offered me the loan of all the material of "*pulverulenta*" in that institution, about one thousand specimens. I wish at this time to express my most sincere thanks to him and to the United States National Museum for this courtesy and kindness.

Smith's types of *pulverulenta* were also in the National Museum; and upon doing the genitalia of these, it was found that they represented not one, but two species. Thus it was necessary to limit Smith's name to one species. This was done by choosing the specimen that best fitted his description. After this there remained five unnamed species, all more or less similar and with no outstanding superficial differences.

***Pseudanarta pulverulenta* (Smith)**

Perigea pulverulenta Smith, Trans. Am. Ent. Soc., XVIII, 105, 1891.

Bryomima pulverulenta (Smith), Hampson, Cat. Lep. Phal. B. M., VI, 392, 1906.

Pseudanarta pulverulenta (Smith), Barnes & Benjamin, Pan-Pacific Entomologist, III, 110, 1927.

The following is an exact copy of Smith's description.

"*Perigea pulverulenta* n. sp.—Ground color a vague, powdery reddish gray, varying in tint according to the relative predominance of red, white, or blackish scales. All the normal maculation present, but obscured by the powdery base. Basal line geminate, concolorous, defining lines fuscous or blackish, twice angulated. T. a. line somewhat paler, with fuscous or black defining lines, not always complete and sometimes vague; outwardly oblique, somewhat curved, inwardly angulate on the median and submedian veins. T. p. line obsoletely geminate, the inner line lunulate, the outer vague and even, sometimes wanting, its course evenly bisinuate without the usual long outcurve from the costa over reniform. S. t. space paler than median and usually also than terminal space; s. t. line pale, diffuse, sinuate, marked by the difference in shade between s. t. and terminal space, and also by a more or less obvious preceding shade, Fringes interlined with fuscous, feebly scalloped; median space, as a whole, somewhat darker than the rest of the wing; a dusky or blackish median shade, which in the submedian interspace sometimes forms a complete connection between the median lines. Claviform small, though quite wide, concolorous, incompletely outlined in black. Orbicular round or oval, oblique, pale ringed with dusky centre. Reniform upright, quite large, somewhat constricted centrally, pale ringed with concolorous or paler center. A dusky costal patch in the s. t. space and a paler apical patch in terminal space. Secondaries fuscous, with a broad black outer margin, a narrow preceding dusky line and a dusky discal lunule. Fringes pale, interlined with fuscous. Beneath powdery, primaries darker, both wings with a discal spot, narrow outer line and broad dark outer margin, all variable in distinctness. Expands 1.00-1.08 inches; 25-27 mm.

Hab. Colorado (Bruce); Las Vegas, N. Mex. (Meeske); New Mexico (Snow); Arizona (Edwards).

This little species has long puzzled me, and I refer it to *Perigea*, rather because it is congeneric with *P. perplexa* Grt. than because it strictly belongs here.*

Four of the specimens collected by Mr. Bruce are in the collection of the United States National Museum, two of them are labeled simply 'Colorado,' the others labeled 'Foot-hills.' There is little or no variation, and the species once generically placed, is easily recognizable."

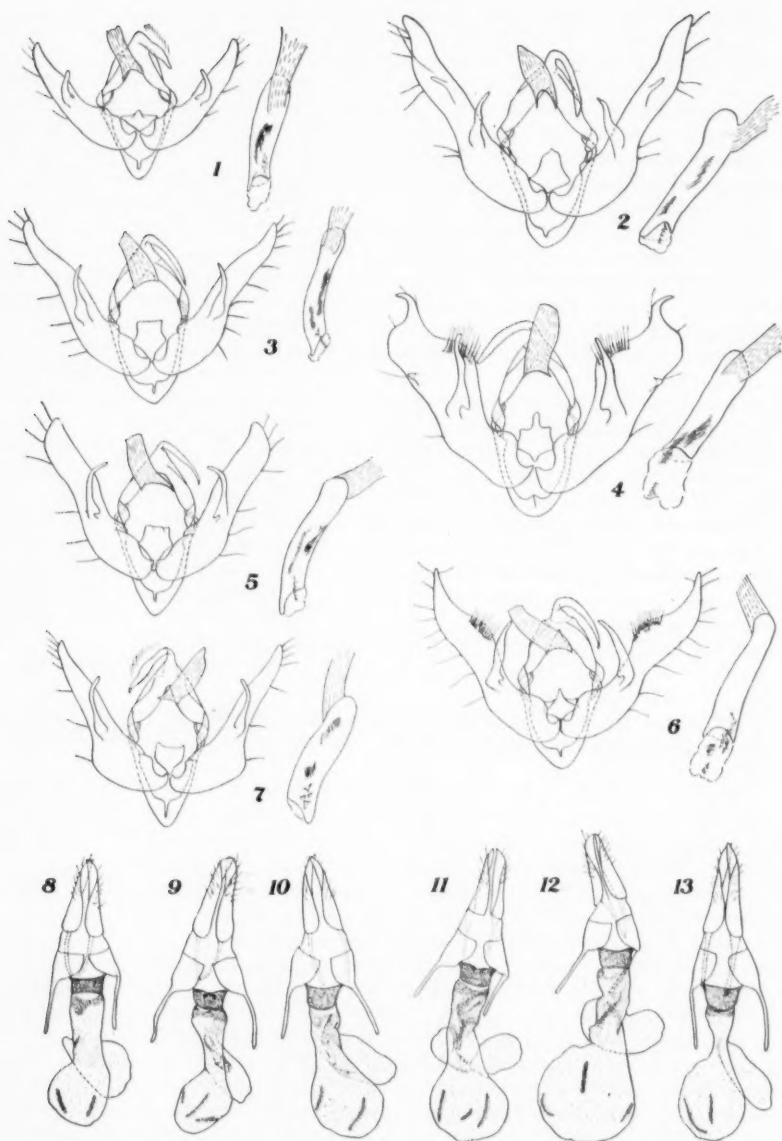
The specimen chosen as type is quite pinkish with a diffuse powdery appearance and with the normal markings rather obscured.

Male genitalia symmetrical; the tegumen moderate; the uncus rather stout, dilated in the middle and distinctly pilose; vinculum narrow; valves moderately long and narrow, the apex subacute, the outer margin expanded at base, no corona, the clasper long, narrow and curved; juxta subtriangular; aedeagus short and stout, the vesica armed with two groups of long spinules and a group of seven stout spines, which form a perfect sequence in size.

Female genitalia symmetrical; the ovipositor moderately long and well chitinized, flattened laterally, blade-like in appearance; ostium with anterior margin slightly concave; posterior part of the ductus bursa with a strongly chitinized ring, forming ventrally a transverse plate, rectangular in shape, approximately twice as long as wide; immediately following this, but dorsally, another transverse plate, narrow and lobate on the right side; the remainder of the ductus bursa very lightly and evenly chitinized; the bursa with two strongly scobinate ridges (the signa).

**Perigea perplexa* Grt. (non descr.) equals *Perigea alfkeni* Grt. equals *Orthodes alfkeni* (Grt.)

PLATE IX.



Male genitalia of species of *Pseudanarta* Grt. 1, *P. crocea* Hy. Edw. (genotype); 2, *P. daemonialis* n. sp.; 3, *P. exasperata* n. sp.; 4, *P. vexata* n. sp.; 5, *P. damnata* n. sp.; 6, *P. perplexa* n. sp.; 7, *P. pulverulenta* Sm.

Female genitalia of species of *Pseudanarta* Grt. 8, *P. pulverulenta* Sm.; 9, *P. exasperata* n. sp.; 10, *P. perplexa* n. sp.; 11, *P. damnata* n. sp.; 12, *P. vexata* n. sp.; 13, *P. daemonialis* n. sp.

Specimens examined: 140 from Arizona, New Mexico and Colorado [in Coll. U. S. N. M., Los Angeles Museum, and Franclemont].

The five new species which follow are described by comparative characters only, as full descriptions would accomplish nothing. The reader is referred to the accompanying drawings for a full understanding of the real differences between all the species.

***Pseudanarta exasperata* n. sp.**

Superficially this species is very close to *pulverulenta*, but less powdery in appearance and with the markings generally more distinct.

The male genitalia differ from *pulverulenta* in the narrow non pilose uncus, the unexpanded basal outer margin of valve, the larger juxta, triangular at base and quadrate above, and the longer and less stout aedocagus.

The female genitalia differ in the longer ovipositor, the deeper ostium, with a symmetrical raised area at the middle of the outer margin, and the slightly more heavily sclerotized ductus bursa.

Holotype, ♂, Paradise, Cochise Co., Ariz. (in Coll. U. S. N. M.)

Paratypes, 268 ♂♂, 217 ♀♀, Arizona and New Mexico (various collectors), [in Coll. U. S. N. M. and Franclemont].*

***Pseudanarta perplexa* n. sp.**

This species differs from *pulverulenta* and *exasperata* by the suppression of the pinkish suffusion and the somewhat crisper and more well defined markings. In general, the species is grayer and the dark markings blacker.

The male genitalia differ at once from the two preceding species by the expanded area of the costa, a little above the middle of the valve, and by the patch of spines borne on the expanded area. They also differ in the generally broader valves, with the apex acute; the acutely pointed outer edge of the juxta; and the aedocagus, which is like that of *exasperata*, not as stout or as short as *pulverulenta*.

The female genitalia differ from those of *pulverulenta* by the longer genital plate and the more heavily sclerotized ductus bursa; from *exasperata* by the shorter ovipositor and by the shape of the chitinous ring at the top of the ductus bursa.

Holotype, ♂, No. 62, Colo. (Bruce). This is one of Smith's cotypes of *pulverulenta* [in Coll. U. S. N. M.]

Paratypes, 159 ♂♂, 61 ♀♀, Arizona, New Mexico, Colorado, and Utah (various collectors), [in Coll. U. S. N. M., Los Angeles Museum, and Franclemont].

***Pseudanarta damnata* n. sp.**

This species resembles *perplexa*, but the markings are crisper, and the moth is more black and white in general tone, with practically no evidence of pinkish shades.

The male genitalia differ from all the preceding species by the truncate apices and the parallel sides of the valves; the aedocagus is similar to that of *exasperata*.

The female genitalia differ from all the foregoing species by their very highly sclerotized ductus bursa; the ovipositor is of approximately the same length as that of *pulverulenta*.

Holotype, ♂, Paradise, Cochise Co., Arizona, Sept. 1-7 [in Coll. U. S. N. M.].

Paratypes, 17 ♂♂, 14 ♀♀, New Mexico, Arizona (various collectors), [in Coll. U. S. N. M. and Franclemont].

*It is not certain that all the female specimens included as paratypes under this and the following species are correctly placed.

***Pseudanarta vexata* n. sp.**

Superficially this species is indistinguishable from the last.

The male genitalia recall *perplexa*, in that they have the costa of the valve expanded slightly above the middle and possess a patch of spines at this point. The valves differ from *perplexa* however, in that they end in a curved point and in the possession of a pollex. The juxta is quadrate, triangular basad and with a moderately long rounded projection distad. The aedoeagus is about as in *pulverulenta*.

The female genitalia recall the last, but the ductus bursa is not quite so heavily sclerotized; other than this they are very similar.

Holotype, ♂, Palmerlee, Arizona [in Coll. U. S. N. M.].

Paratypes, 1 ♂, 3 ♀♀, Palmerlee, Arizona [in Coll. U. S. N. M. and Franclemont].

***Pseudanarta daemonalis* n. sp.**

This species differs from all the others in its generally more uniform dark color, lacking the whitish shades of the preceding species, especially the last three; the markings are distinct, not "blurred" as in *pulverulenta*; it lacks all hint of the pinkish suffusion of that and the subsequent species.

The male genitalia differ from all except those of the last species by the possession of a pollex; they differ from *vexata* in the absence of the expanded costal area, the absence of the hooked tip of the valves, and the long and narrow valves. The juxta is bell-shaped; the aedoeagus is about like that of *damnata*.

The female genitalia differ in their longer ovipositor and their very deep genital plate; the ductus bursa is very lightly sclerotized, recalling *pulverulenta*, but it is even more lightly chitinized than that species.

Holotype ♂, Las Vegas HS, N. Mex. [in Coll. U. S. N. M.].

Paratypes 8 ♂♂, 29 ♀♀, Colorado, New Mexico, Arizona (various collectors), [in Coll. U. S. N. M. and Franclemont].

NOTE**AN EARLY RECORD OF APHID FLIGHT**

In the Arctic exploration undertaken by Sir Edward Parry in 1827, an attempt was made to reach the pole by a journey over the ice north of Little Table Island.

"While Parry and Ross marched on ahead of the boats to beat a track the most insignificant objects became a source of intense interest and curiosity. One day two flies on the ice were regarded with a degree of attention that would have been ludicrous under other circumstances; and equally important was an *Aphis borealis* in a languid state a hundred miles away from land."

From the text this would seem to have been prior to July 17, 1827. On that date they made note that the ice was drifting south. On July 23 they gave up the attempt to reach the Pole at latitude 82° 45'. *Aphis borealis* is a recognized sub-arctic species feeding on willow and dandelion.

In the same paper (1851, Chamber's Papers for the People, p. 26) is mention of a naturalist, Mr. Drummond, a member of Franklin's party, who collected insects west of the Mackenzie River in 1825.

R. P. Gorham.

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